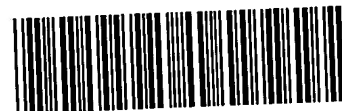


#11

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## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/836,470B

DATE: 02/21/2002

TIME: 11:17:05

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3 <110> APPLICANT: KUWABARA, Yoko  
 4 HASHIGUCHI, , Kenichi  
 5 NAKAMATSU, Tsuyoshi  
 6 KURAHASHI, Osamu  
 7 MORI, Yukiko  
 8 ITO, Hisao  
 10 <120> TITLE OF INVENTION: CARBAMOYL-PHOSPHATE SYNTHETASE GENE OF CORYNEFORM BACTERIA  
 AND METHOD FOR  
 11 PRODUCING L-ARGININE  
 13 <130> FILE REFERENCE: 205801USODIV  
 15 <140> CURRENT APPLICATION NUMBER: US 09/836,470B  
 16 <141> CURRENT FILING DATE: 2001-04-18  
 18 <150> PRIOR APPLICATION NUMBER: US 09/629,616  
 19 <151> PRIOR FILING DATE: 2000-07-31  
 21 <150> PRIOR APPLICATION NUMBER: US 09/494,359  
 22 <151> PRIOR FILING DATE: 2000-01-31  
 24 <150> PRIOR APPLICATION NUMBER: JP 11-24149  
 25 <151> PRIOR FILING DATE: 1999-02-01  
 27 <160> NUMBER OF SEQ ID NOS: 7  
 29 <170> SOFTWARE: PatentIn version 3.1  
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 33 <212> TYPE: DNA  
 34 <213> ORGANISM: Brevibacterium lactofermentum  
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 38 <222> LOCATION: (283)..(1461)  
 39 <223> OTHER INFORMATION:  
 42 <220> FEATURE:  
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 53 acttggtgcag acggagttgc gcaagacgct taacgggttg gtgcatagta tgcacgcgcc 180  
 55 gcattgcata taatgcaatg aattgaataa actacattca gggttatcaa ccagccaatt 240  
 57 tcttttaaaa agacagacac acgaaaggcg acaacagtca cc gtg agt aaa gac 294  
 58 Val Ser Lys Asp  
 59 1  
 61 acc acc acc tac cag gga gtc acc gag atc gga tcc gtt ccg gca tac 342  
 62 Thr Thr Thr Tyr Gln Gly Val Thr Glu Ile Gly Ser Val Pro Ala Tyr  
 63 5 10 15 20  
 65 ctg gtt ctt gca gac gga cgt acc ttc acc gga ttt ggc ttt gga gct 390

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70 Ile Gly Thr Thr Leu Gly Glu Ala Val Phe Thr Thr Ala Met Thr Gly
71          40          45          50
73 tac caa gaa acc atg acc gat cct tcc tat cac cgc cag att gtt gtg 486
74 Tyr Gln Glu Thr Met Thr Asp Pro Ser Tyr His Arg Gln Ile Val Val
75          55          60          65
77 gct acc gca cca cag atc ggt aac acc ggc tgg aac gat gag gac aac 534
78 Ala Thr Ala Pro Gln Ile Gly Asn Thr Gly Trp Asn Asp Glu Asp Asn
79          70          75          80
81 gag tcc cgc gac ggc aag att tgg gtt gca ggc ctt gtt atc cgc gac 582
82 Glu Ser Arg Asp Gly Lys Ile Trp Val Ala Gly Leu Val Ile Arg Asp
83 85          90          95          100
85 ctc gca gca cgt gtg tcc aac tgg cgc gcc acc acc tcc ttg cag cag 630
86 Leu Ala Ala Arg Val Ser Asn Trp Arg Ala Thr Thr Ser Leu Gln Gln
87          105          110          115
89 gaa atg gca gac caa ggc atc gtc ggc atc ggc gga atc gac acc cgc 678
90 Glu Met Ala Asp Gln Gly Ile Val Gly Ile Gly Gly Ile Asp Thr Arg
91          120          125          130
93 gca ctg gtt cgc cac ctg cgc aac gaa ggt tcc atc gca gcg ggc atc 726
94 Ala Leu Val Arg His Leu Arg Asn Glu Gly Ser Ile Ala Ala Gly Ile
95          135          140          145
97 ttc tcc ggc gct gac gca cag cgc cca gtt gaa gaa ctc gta gag atc 774
98 Phe Ser Gly Ala Asp Ala Gln Arg Pro Val Glu Glu Leu Val Glu Ile
99          150          155          160
101 gtc aag aat cag cca gca atg acc ggc gca aac ctc tcc gtt gag gtc 822
102 Val Lys Asn Gln Pro Ala Met Thr Gly Ala Asn Leu Ser Val Glu Val
103 165          170          175          180
105 tct gct gat gaa acc tac gtc atc gaa gct gag ggc gaa gag cgc cac 870
106 Ser Ala Asp Glu Thr Tyr Val Ile Glu Ala Glu Gly Glu Glu Arg His
107          185          190          195
109 acc gtc gtg gcc tac gac ctg ggc att aag caa aac acc cca cgt cgt 918
110 Thr Val Val Ala Tyr Asp Leu Gly Ile Lys Gln Asn Thr Pro Arg Arg
111          200          205          210
113 ttc tct gca cgc ggt gtt cgc acc gtc atc gtg cct gct gaa acc cca 966
114 Phe Ser Ala Arg Gly Val Arg Thr Val Ile Val Pro Ala Glu Thr Pro
115          215          220          225
117 ttg gag gac atc aag cag tac aac cca tca ggc gtg ttt atc tcc aat 1014
118 Leu Glu Asp Ile Lys Gln Tyr Asn Pro Ser Gly Val Phe Ile Ser Asn
119          230          235          240
121 ggc cct ggc gac cct gca gca gca gac gtc atg gtt gat atc gtc cgc 1062
122 Gly Pro Gly Asp Pro Ala Ala Ala Asp Val Met Val Asp Ile Val Arg
123 245          250          255          260
125 gaa gtt ctg gaa gcc gac att cca ttc ttt ggc atc tgc ttc ggc aac 1110
126 Glu Val Leu Glu Ala Asp Ile Pro Phe Phe Gly Ile Cys Phe Gly Asn
127          265          270          275
129 cag atc ctc ggc cgc gca ttc ggc atg gag acc tac aag ctg aag ttc 1158
130 Gln Ile Leu Gly Arg Ala Phe Gly Met Glu Thr Tyr Lys Leu Lys Phe

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135	295	300	305	
137 atc gac atc acc gcc cag aac cac ggc ttc gca ctc aag ggt gaa gca				1254
138 Ile Asp Ile Thr Ala Gln Asn His Gly Phe Ala Leu Lys Gly Glu Ala				
139	310	315	320	
141 ggc cag gaa ttc gag aca gat ttc ggc act gcg att gtc acc cac acc				1302
142 Gly Gln Glu Phe Glu Thr Asp Phe Gly Thr Ala Ile Val Thr His Thr				
143 325	330	335	340	
145 tgc ctt aac gac ggc gtc gtt gaa ggt gtt gcg ctg aag tcc gga cgc				1350
146 Cys Leu Asn Asp Gly Val Val Glu Gly Val Ala Leu Lys Ser Gly Arg				
147	345	350	355	
149 gca tac tcc gtt cag tac cac cca gag gcc gct gcc ggc cca aat gat				1398
150 Ala Tyr Ser Val Gln Tyr His Pro Glu Ala Ala Ala Gly Pro Asn Asp				
151	360	365	370	
153 gca agc ccc ctg ttt gac cag ttt gtt gag ctg atg gat gca gac gct				1446
154 Ala Ser Pro Leu Phe Asp Gln Phe Val Glu Leu Met Asp Ala Asp Ala				
155	375	380	385	
157 cag aag aaa ggc gca taaataac atg cca aag cgt tca gat att aac cac				1496
158 Gln Lys Lys Gly Ala	Met Pro Lys Arg Ser Asp Ile Asn His			
159	390	395	400	
161 gtc ctc gtc atc ggt tcc ggc ccc atc gtc att ggc cag gca tgt gaa				1544
162 Val Leu Val Ile Gly Ser Gly Pro Ile Val Ile Gly Gln Ala Cys Glu				
163	405	410	415	
165 ttc gac tac tcc ggc acc cag gct tgc cgc gtg ctg aag gaa gag gga				1592
166 Phe Asp Tyr Ser Gly Thr Gln Ala Cys Arg Val Leu Lys Glu Glu Gly				
167	420	425	430	
169 ctg cgc gtc acc ctc atc aac tcc aac cca gca acg atc atg acc gac				1640
170 Leu Arg Val Thr Leu Ile Asn Ser Asn Pro Ala Thr Ile Met Thr Asp				
171 435	440	445	450	
173 cca gaa atg gct gac cac acc tac gtg gag cca atc gag ccg gaa tac				1688
174 Pro Glu Met Ala Asp His Thr Tyr Val Glu Pro Ile Glu Pro Glu Tyr				
175	455	460	465	
177 atc gac aag att ttc gct aag gag atc gag cag ggc cac cca atc gac				1736
178 Ile Asp Lys Ile Phe Ala Lys Glu Ile Glu Gln Gly His Pro Ile Asp				
179	470	475	480	
181 gcc gtc ctg gca acc ctt ggt ggc cag act gca ctt aac gca gct atc				1784
182 Ala Val Leu Ala Thr Leu Gly Gly Gln Thr Ala Leu Asn Ala Ala Ile				
183	485	490	495	
185 cag ctg gat cgc ctc ggc atc ctg gaa aag tac ggc gtt gaa ctc atc				1832
186 Gln Leu Asp Arg Leu Gly Ile Leu Glu Lys Tyr Gly Val Glu Leu Ile				
187	500	505	510	
189 ggt gca gac atc gat gcc att gag cgc ggc gaa gat cgc cag aag ttc				1880
190 Gly Ala Asp Ile Asp Ala Ile Glu Arg Gly Glu Asp Arg Gln Lys Phe				
191 515	520	525	530	
193 aag gat att gtc acc acc atc ggt ggc gaa tcc gcg cgt tcc cgc gtc				1928
194 Lys Asp Ile Val Thr Thr Ile Gly Gly Glu Ser Ala Arg Ser Arg Val				
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198	Cys	His	Asn	Met	Asp	Glu	Val	His	Glu	Thr	Val	Ala	Glu	Leu	Gly	Leu	
199				550					555					560			
201	cca	gta	gtc	gtg	cgt	cca	tcc	ttc	act	atg	ggg	ggc	ctg	ggc	tcc	ggt	2024
202	Pro	Val	Val	Val	Arg	Pro	Ser	Phe	Thr	Met	Gly	Gly	Leu	Gly	Ser	Gly	
203				565					570					575			
205	ctt	gca	tac	aac	acc	gaa	gac	ctt	gag	cgc	atc	gca	ggg	ggc	gga	ctt	2072
206	Leu	Ala	Tyr	Asn	Thr	Glu	Asp	Leu	Glu	Arg	Ile	Ala	Gly	Gly	Gly	Leu	
207			580						585					590			
209	gct	gca	tct	cct	gaa	gca	aac	gtc	ttg	atc	gaa	gaa	tcc	atc	ctt	ggt	2120
210	Ala	Ala	Ser	Pro	Glu	Ala	Asn	Val	Leu	Ile	Glu	Glu	Ser	Ile	Leu	Gly	
211	595					600					605				610		
213	tgg	aag	gaa	ttc	gag	ctc	gag	ctc	atg	cgc	gat	acc	gca	gac	aac	gtt	2168
214	Trp	Lys	Glu	Phe	Glu	Leu	Glu	Leu	Met	Arg	Asp	Thr	Ala	Asp	Asn	Val	
215				615						620					625		
217	gtg	gtt	atc	tgc	tcc	att	gaa	aac	gtc	gac	gca	ctg	ggc	gtg	cac	acc	2216
218	Val	Val	Ile	Cys	Ser	Ile	Glu	Asn	Val	Asp	Ala	Leu	Gly	Val	His	Thr	
219				630						635					640		
221	ggc	gac	tct	gtc	acc	gtg	gca	cct	gcc	ctg	acc	ctg	act	gac	cgt	gaa	2264
222	Gly	Asp	Ser	Val	Thr	Val	Ala	Pro	Ala	Leu	Thr	Leu	Thr	Asp	Arg	Glu	
223				645					650					655			
225	ttc	cag	aag	atg	cgc	gat	cag	ggg	atc	gcc	atc	atc	cgc	gag	gtc	ggc	2312
226	Phe	Gln	Lys	Met	Arg	Asp	Gln	Gly	Ile	Ala	Ile	Ile	Arg	Glu	Val	Gly	
227			660					665						670			
229	gtg	gac	acc	ggg	gga	tgt	aac	atc	cag	ttc	gct	atc	aac	cca	gtt	gat	2360
230	Val	Asp	Thr	Gly	Gly	Cys	Asn	Ile	Gln	Phe	Ala	Ile	Asn	Pro	Val	Asp	
231	675					680					685				690		
233	ggc	cgc	atc	atc	acc	att	gag	atg	aac	cca	cgt	gtg	tct	cgt	tcc	tcc	2408
234	Gly	Arg	Ile	Ile	Thr	Ile	Glu	Met	Asn	Pro	Arg	Val	Ser	Arg	Ser	Ser	
235					695					700					705		
237	gag	ctg	gca	tcc	aag	gca	acg	ggc	ttc	cca	att	gcc	aag	atg	gct	gcc	2456
238	Ala	Leu	Ala	Ser	Lys	Ala	Thr	Gly	Phe	Pro	Ile	Ala	Lys	Met	Ala	Ala	
239				710					715						720		
241	aag	ctg	gct	atc	gga	tac	acc	ctg	gat	gag	atc	acc	aac	gac	atc	act	2504
242	Lys	Leu	Ala	Ile	Gly	Tyr	Thr	Leu	Asp	Glu	Ile	Thr	Asn	Asp	Ile	Thr	
243			725						730						735		
245	ggg	gaa	acc	cca	gct	gag	ttt	gag	ccc	acc	atc	gac	tac	gtc	gtg	gtc	2552
246	Gly	Glu	Thr	Pro	Ala	Ala	Phe	Glu	Pro	Thr	Ile	Asp	Tyr	Val	Val	Val	
247			740					745						750			
249	aag	gcc	cca	cgc	ttt	gct	ttc	gag	aag	ttt	gtc	ggc	gct	gat	gac	act	2600
250	Lys	Ala	Pro	Arg	Phe	Ala	Phe	Glu	Lys	Phe	Val	Gly	Ala	Asp	Asp	Thr	
251	755				760						765				770		
253	ttg	acc	acc	acc	atg	aag	tcc	gtc	ggg	gag	gtc	atg	tcc	ctg	ggc	cgt	2648
254	Leu	Thr	Thr	Thr	Met	Lys	Ser	Val	Gly	Glu	Val	Met	Ser	Leu	Gly	Arg	
255					775					780					785		
257	aac	tac	att	gca	gca	ctg	aac	aag	gca	ctg	cgt	tcc	ctg	gaa	acc	aag	2696
258	Asn	Tyr	Ile	Ala	Ala	Leu	Asn	Lys	Ala	Leu	Arg	Ser	Leu	Glu	Thr	Lys	
259				790						795					800		
261	cag	cag	ggg	ttc	tgg	acc	aag	cct	gat	gag	ttc	ttc	gca	ggg	gag	cgc	2744

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263			805					810					815				
265	gct	acc	gat	aag	gca	gct	gtt	ctg	gaa	gat	ctc	aag	cgc	cca	acc	gaa	2792
266	Ala	Thr	Asp	Lys	Ala	Ala	Val	Leu	Glu	Asp	Leu	Lys	Arg	Pro	Thr	Glu	
267			820					825					830				
269	ggc	cgc	ctc	tac	gac	gtt	gag	ctg	gca	atg	cgc	ctt	ggc	gca	agc	gtg	2840
270	Gly	Arg	Leu	Tyr	Asp	Val	Glu	Leu	Ala	Met	Arg	Leu	Gly	Ala	Ser	Val	
271	835						840				845				850		
273	gaa	gaa	ctc	tac	gaa	gca	tct	tct	att	gat	cct	tgg	ttc	ctc	gcc	gag	2888
274	Glu	Glu	Leu	Tyr	Glu	Ala	Ser	Ser	Ile	Asp	Pro	Trp	Phe	Leu	Ala	Glu	
275					855					860				865			
277	ctt	gaa	gct	ctc	gtg	cag	ttc	cgc	cag	aag	ctc	gtt	gac	gca	cca	ttc	2936
278	Leu	Glu	Ala	Leu	Val	Gln	Phe	Arg	Gln	Lys	Leu	Val	Asp	Ala	Pro	Phe	
279					870					875				880			
281	ctc	aac	gaa	gat	ctc	ctg	cgc	gaa	gca	aag	ttc	atg	ggt	ctg	tcc	gac	2984
282	Leu	Asn	Glu	Asp	Leu	Leu	Arg	Glu	Ala	Lys	Phe	Met	Gly	Leu	Ser	Asp	
283			885					890					895				
285	ctg	cag	atc	gca	gcc	ctt	cgc	cca	gag	ttc	gct	ggc	gaa	gac	ggc	gta	3032
286	Leu	Gln	Ile	Ala	Ala	Leu	Arg	Pro	Glu	Phe	Ala	Gly	Glu	Asp	Gly	Val	
287		900					905					910					
289	cgc	acc	ttg	cgt	ctg	tcc	cta	ggc	atc	cgc	cca	gta	ttc	aag	act	gtg	3080
290	Arg	Thr	Leu	Arg	Leu	Ser	Leu	Gly	Ile	Arg	Pro	Val	Phe	Lys	Thr	Val	
291	915					920				925					930		
293	gat	acc	tgt	gca	gca	gag	ttt	gaa	gct	aag	act	ccg	tac	cac	tac	tcc	3128
294	Asp	Thr	Cys	Ala	Ala	Glu	Phe	Glu	Ala	Lys	Thr	Pro	Tyr	His	Tyr	Ser	
295					935					940				945			
297	gca	tac	gag	ctg	gat	cca	gca	gct	gag	tct	gag	gtc	gca	cca	cag	act	3176
298	Ala	Tyr	Glu	Leu	Asp	Pro	Ala	Ala	Glu	Ser	Glu	Val	Ala	Pro	Gln	Thr	
299					950				955				960				
301	gag	cgt	gaa	aag	gtc	ctg	atc	ttg	ggc	tcc	ggt	cca	aac	cgc	atc	ggc	3224
302	Glu	Arg	Glu	Lys	Val	Leu	Ile	Leu	Gly	Ser	Gly	Pro	Asn	Arg	Ile	Gly	
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305	cag	ggc	atc	gag	ttc	gac	tat	tcc	tgt	gtt	cac	gca	gct	ctt	gag	ctc	3272
306	Gln	Gly	Ile	Glu	Phe	Asp	Tyr	Ser	Cys	Val	His	Ala	Ala	Leu	Glu	Leu	
307		980					985					990					
309	tcc	cgc	gtc	ggc	tac	gaa	act	gtc	atg	gtc	aac	tgc	aac	cca	gag		3317
310	Ser	Arg	Val	Gly	Tyr	Glu	Thr	Val	Met	Val	Asn	Cys	Asn	Pro	Glu		
311	995				1000					1005							
313	acc	gtg	tcc	acc	gac	tac	gac	acc	gct	gac	cgc	ctg	tac	ttc	gag		3362
314	Thr	Val	Ser	Thr	Asp	Tyr	Asp	Thr	Ala	Asp	Arg	Leu	Tyr	Phe	Glu		
315	1010					1015					1020						
317	cca	ctg	acc	ttc	gaa	gac	gtc	atg	gag	gtc	tac	cac	gct	gag	gcg		3407
318	Pro	Leu	Thr	Phe	Glu	Asp	Val	Met	Glu	Val	Tyr	His	Ala	Glu	Ala		
319	1025					1030					1035						
321	cag	tcc	ggc	acc	gtc	gca	ggt	gtt	atc	gtc	cag	ctt	ggt	ggc	cag		3452
322	Gln	Ser	Gly	Thr	Val	Ala	Gly	Val	Ile	Val	Gln	Leu	Gly	Gly	Gln		
323	1040					1045					1050						
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